

## CLAIMS

1. A method which comprises exposing an oxidized white liquor produced by oxidizing a white liquor with oxygen containing gas in the presence of lime mud, manganese dioxide or both, to a controlled temperature effective to increase the concentration of  $PS_{UV}$  measured at 285 or 286 nm or  $PS_{VIS}$  measured at 416 nm and the  $PS_{UV}/PS_{GR}$  or  $PS_{VIS}/PS_{GR}$  ratio of polysulphide in the oxidized white liquor.
2. A method according to claim 1, wherein said temperature is 20°C to 95°C and said exposing is for a time up to 72 hours.
3. A method according to claim 2, wherein said oxidized white liquor is maintained at a temperature of 50°C to 90°C for 1 to 48 hours.
4. A method of increasing the concentration of  $PS_{UV}$  measured at 285 or 286 nm or  $PS_{VIS}$  measured at 416 nm and the  $PS_{UV}/PS_{GR}$  or  $PS_{VIS}/PS_{GR}$  ratio of a polysulphide liquor generated by oxidation of white liquor in the presence of lime mud, manganese dioxide or both, said method comprising heating or cooling if necessary and then storing said polysulphide liquor at a temperature between 20°C and 95°C for a time of up to 72 hours.
5. A method according to claim 4, wherein said polysulphide liquor is maintained at a temperature of 50°C to 90°C for 1 to 48 hours.
6. A method of increasing the yield of pulp in Kraft pulping with a white liquor containing polysulphide comprising:

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- i) oxidizing a white liquor with oxygen containing gas in the presence of lime mud, manganese dioxide or both to produce an oxidized white liquor containing polysulphide,
- ii) heating or cooling if necessary and then storing said oxidized white liquor to increase the concentration of  $PS_{UV}$  measured at 285 or 286 nm or  $PS_{VIS}$  measured at 416 nm and the  $PS_{UV}/PS_{GR}$  or  $PS_{VIS}/PS_{GR}$  ratio of polysulphide in the oxidized white liquor, and in a subsequent step:
- iii) delignifying pulp with the oxidized white liquor from step ii).

7. A method according to claim 6, wherein said oxidizing in step i) is in the presence of lime mud and a catalytic amount of manganese dioxide, and including a step of:

separating said oxidized white liquor produced in step i) from said lime mud and manganese dioxide prior to said heating or cooling if necessary and storing in step ii).

8. A method according to claim 7, wherein step ii) comprises heating or cooling if necessary said oxidized white liquor to a temperature of 20°C to 95°C for a time up to 72 hours.

9. A method according to claim 8, wherein said temperature is 50 to 90°C and said time is 1 to 48 hours.

10. A method according to claim 8, including prior to step i):

causticizing a green liquor with lime in the presence of manganese dioxide to produce said white liquor and lime mud containing said manganese dioxide.

N. A method of producing an oxidized white liquor containing polysulphide comprising:

- i) oxidizing a white liquor with oxygen containing gas in the presence of lime mud, manganese dioxide or both to produce an oxidized white liquor containing polysulphide and having a first  $PS_{UV}$  concentration measured at 285 or 286 nm or  $PS_{VIS}$  concentration measured at 416 nm or  $PS_{UV}/PS_{GR}$  or  $PS_{VIS}/PS_{GR}$  ratio, and
- ii) heating or cooling if necessary and then storing said oxidized white liquor to produce an oxidized white liquor having a second  $PS_{UV}$  concentration measured at 285 or 286 nm or  $PS_{VIS}$  concentration measured at 416 nm or  $PS_{UV}/PS_{GR}$  or  $PS_{VIS}/PS_{GR}$  ratio, wherein said second concentration or ratio is greater than said first ratio.

12. A method according to claim 11, wherein step ii) comprises heating or cooling if necessary said oxidized white liquor to a temperature of 20°C to 95°C and storing said oxidized white liquor for a time up to 72 hours.

13. A method according to claim 12, wherein said temperature is 50 to 90°C and said time is 1 to 48 hours.

14. A method according to claim 13, including prior to step i):

causticizing a green liquor with lime in the presence of manganese dioxide to produce said white liquor and lime mud containing said manganese dioxide.

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